

# HINGE FOR A NOTEBOOK COMPUTER

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

The present invention relates to a hinge for a notebook computer, and more particularly to a hinge with a simple structure for preventing an LCD monitor from striking a body under an excessive force to fold the notebook computer.

### 2. Description of Related Art

The versatility of notebook computers, particularly their portability, necessitates protection of the LCD screen and thus they were developed with the LCD screen hinged to a keyboard body whereby the delicate screen face can be protected from impact etc when not in use. It was found in early notebook computers that the raised screen would drop too quickly to the body when the computer was being closed, and the impact of the screen on the keyboard frequently caused damage to the computer. Thus, the notebook computer is generally provided with a hinge which can stop the lowering LCD monitor just prior to the final closed position, whereafter the user can carefully complete closing operation.

With reference to Figs. 5 and 6, a conventional hinge is composed of a hinge member (30) and a fastener assembly (40). The hinge member (30) has a connecting sheet (31) for being mounted on an LCD monitor (not shown). A seat (32) has a lateral portion for being mounted on a body of the notebook computer, and an upright portion perpendicular to the lateral portion. A pintle (33) extends between the connecting sheet (31) and the upright portion of the seat (32).

1           The fastener assembly (40) has a first positioning disk (41) and a second  
2 positioning disk (42) in turn provided outside the pintle and at an exterior side of  
3 the upright portion, wherein the first positioning disk (41) is securely mounted  
4 on the upright portion, and the second positioning disk (42) matches the first  
5 positioning disk (41). The first positioning disk (41) has at least one lug (411)  
6 formed at a surface away from the upright portion of the seat (32), and the  
7 second positioning disk (42) has at least one recess (421) defined at a surface  
8 facing the first positioning disk (41). When the notebook is in a closed status, the  
9 lug (411) is received in the recess (421). The positioning disks (41, 42) are  
10 fastened by a nut engaged with a threaded end of the pintle, and a resilient  
11 member (43) is provided between the nut and the second positioning disk (41).

12           Therefore, when a user unfolds the notebook computer, the pintle (33)  
13 and the second positioning member (42) are driven by the connecting sheet (31)  
14 to rotate about the seat (32). The lug (411) of the first positioning member (41)  
15 will be disengaged from the recess (421), and the resilient member (43) is  
16 compressed. Then, the LCD monitor can be retained at any desired angle relative  
17 to the keyboard under the force of the compressed resilient member (43).

18           When the user folds the notebook computer, the pintle (33) and the  
19 second positioning member (42) can be inversely rotate until the lug (411) is  
20 positioned in the recess (421) again. Then, the LCD monitor will not strike the  
21 body even if the user folds with an excessive force.

22           However, the conventional hinge including two positioning members  
23 has a complex structure, which has a high manufacturing cost and it is very  
24 inconvenient to assemble the hinge.

1           Therefore, the invention provides a hinge to mitigate or obviate the  
2   aforementioned problems.

### 3   SUMMARY OF THE INVENTION

4           The main objective of the present invention is to provide a hinge for a  
5   notebook computer which has a simple structure to prevent an LCD monitor  
6   from striking a keyboard body of the notebook computer undergoing an  
7   excessive force to fold the notebook computer.

8           Other objectives, advantages and novel features of the invention will  
9   become more apparent from the following detailed description when taken in  
10   conjunction with the accompanying drawings.

### 11   BRIEF DESCRIPTION OF THE DRAWINGS

12           Fig. 1 is an exploded perspective view of a hinge in accordance with the  
13   present invention;

14           Fig. 2 is a schematic front view of the hinge of the invention;

15           Fig. 3 is a schematic front view of the hinge in a rotating status;

16           Fig. 4 is a side view of Fig. 3;

17           Fig. 5 is an exploded perspective view of a conventional hinge; and

18           Fig. 6 is a front view of the conventional hinge.

### 19   DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

20           With reference to Figs. 1-2, a hinge for a notebook computer in  
21   accordance with the invention is composed of a hinge member (20) and a  
22   fastener assembly (10).

23           The hinge member (20) has a pintle (21) with a non-circular cross  
24   section. In this embodiment, the pintle (21) has two flat surfaces (211)

1 respectively formed at two diametrically opposite sides thereof. An external  
2 thread (212) is formed at a first end of the pintle (21). A connecting part (22) is  
3 formed at a second end of the pintle (21) and fastened on an LCD monitor (not  
4 shown) of the notebook computer.

5 A seat (23) for being fastened on a body of the notebook computer (not  
6 shown) has a lateral portion (231) and an upright portion (232) substantially  
7 perpendicular to the lateral portion (231). The upright portion (232) has a hole  
8 (233) defined therethrough, and the pintle (21) extends through the hole (233).  
9 At least one first washer (24) is provided outside the pintle (21) and between the  
10 upright portion (232) and connecting part (22). Multiple recesses (234) are  
11 evenly defined at an exterior side of the upright portion (232). In this  
12 embodiment, the upright portion (232) has two recesses (234) formed  
13 symmetrically at two diametrically opposite sides of the hole (233). A nut (25) is  
14 engaged with the external thread (212) at the first end of the pintle (21).

15 The fastener assembly (10) is composed of a positioning member (11)  
16 and a resilient member (12) provided outside the pintle (21) and in turn between  
17 the upright portion (232) and the nut (25).

18 The positioning member (11) has multiple protrusions (112) formed at a  
19 surface facing the upright portion (232). In this embodiment, two protrusions  
20 (112) are formed at two diametrically opposite sides of the positioning member  
21 (11) and respectively positioned in the recesses (234). The outermost surfaces of  
22 the protrusions (112) in contact with the innermost surfaces of the recesses (234)  
23 are curved surfaces. An aperture (111) with a non-circular cross section  
24 corresponding to the pintle (21) is axially defined through the positioning

1 member (11).

2 The resilient member (12) can be a spring, multiple springs or the like.

3 In this embodiment, the resilient member (12) includes multiple elastic dished  
4 disks (121) each with a non-circular opening (not numbered) in series provided  
5 outside the pintle (21) with a back-to-back configuration. The axial thicknesses  
6 of the elastic dished disks (121) are gradually increased from the positioning  
7 member (11) to the nut (25). Namely, the elastic dished disk (121) nearest the  
8 positioning member (11) has the smallest thickness, and the elastic dished disk  
9 (121) nearest the nut (25) has the biggest thickness. A second washer (241) is  
10 provided between the nut (25) and the resilient member (12).

11 In use, with reference to Figs. 3 and 4, when a user raises the LCD  
12 monitor from the keyboard body, the connecting part (22) and the pintle (21) are  
13 driven to rotate about the seat (23). The positioning member (11) is also rotated  
14 along with the pintle (21) about the upright portion (232) to disengage the  
15 protrusions (112) from the recesses (234). The elastic dished disks (121) are  
16 pressed by the positioning member (11) to provide a force to position the LCD  
17 monitor at any desired angle. When the user lowers the LCD monitor to  
18 inversely rotate the pintle (21), the protrusions (112) on the positioning member  
19 (11) will be received in the recesses (234) again to stop the descent to prevent the  
20 LCD monitor from striking the body under an excessive force to fold the  
21 notebook computer.

22 Therefore, according to the invention, the hinge is provided with only  
23 one positioning member, so the hinge has a simplified structure and a low  
24 manufacturing cost.

1           It is to be understood, however, that even though numerous  
2 characteristics and advantages of the present invention have been set forth in the  
3 foregoing description, together with details of the structure and function of the  
4 invention, the disclosure is illustrative only, and changes may be made in detail,  
5 especially in matters of shape, size, and arrangement of parts within the  
6 principles of the invention to the full extent indicated by the broad general  
7 meaning of the terms in which the appended claims are expressed.